INSTRUCTION MANUAL

Digi Crown isa

TESTAR
A MARPOSS DIVISION

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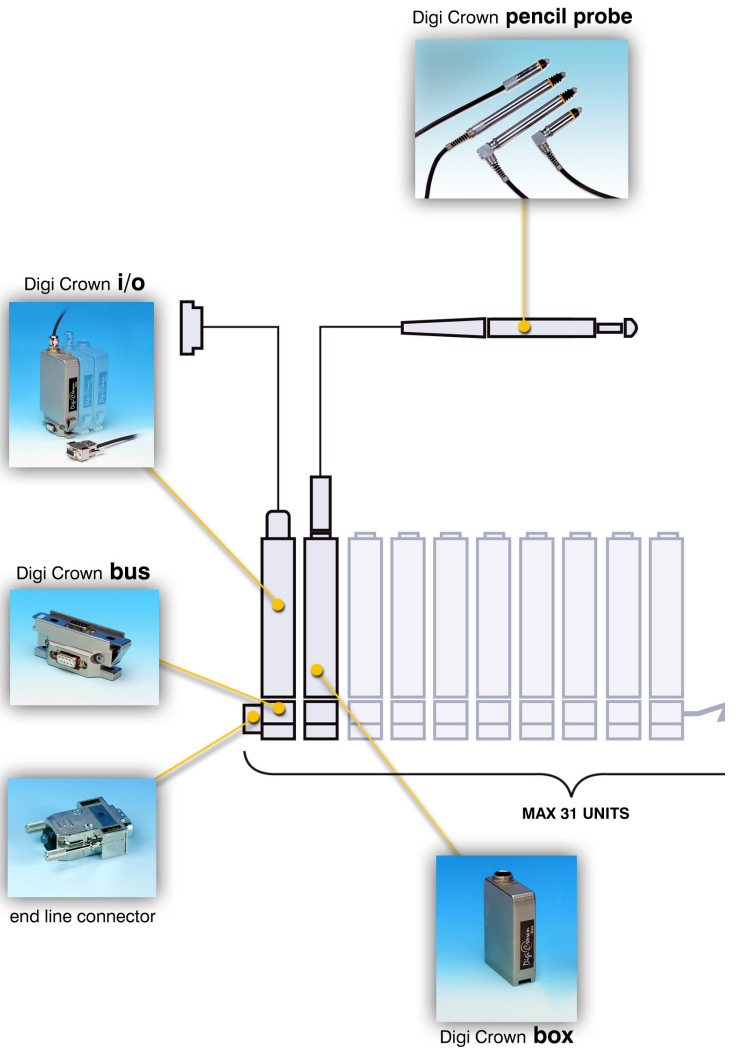
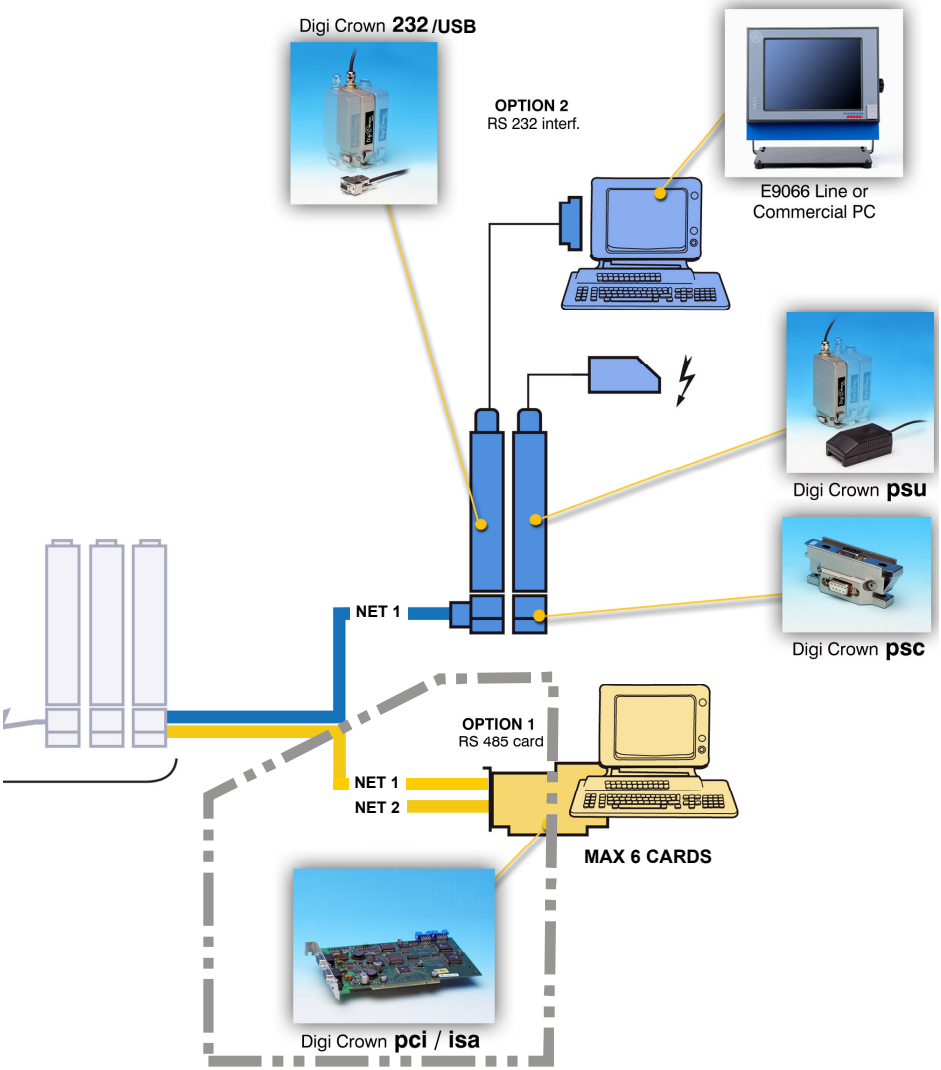
1. INTRODUCTION TO DIGICROWN PROBING LINE SYSTEM

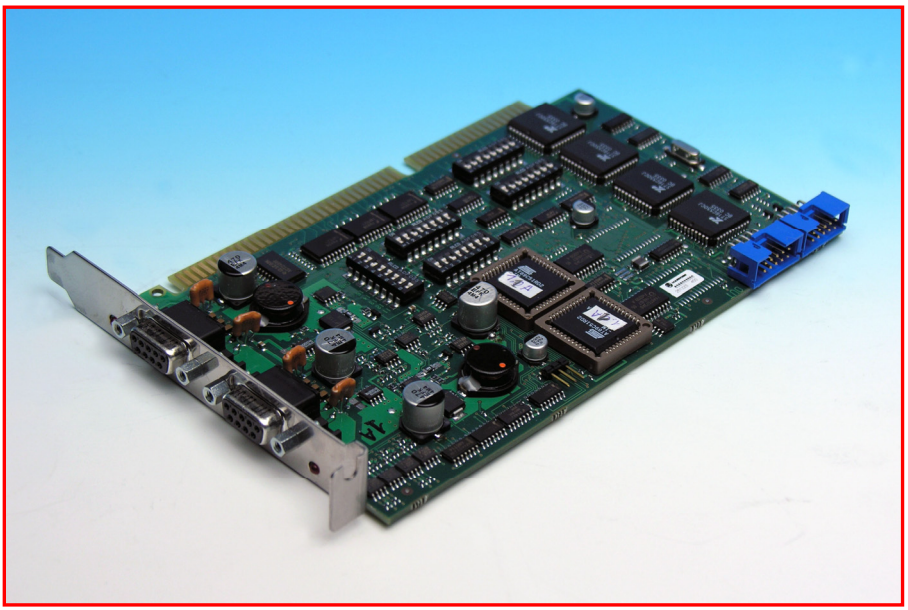
The *DigiCrown* is a flexible measuring system (from 1 to 372 sensors), configured in networks (from 1 to 12) that can be connected to a PC via an RS232/USB serial interface or dedicated RS485 interface cards for PCI or ISA bus.

The diagram below shows the elements of the *DigiCrown* system in their possible configurations. This user manual follows up the installation of the *DigiCrown* ***isa*** card.




Digi Crown 232 /USB
OPTION 2
RS 232 interf.
E9066 Line or
Commercial PC
Digi Crown psu
Digi Crown psc
NET 1
OPTION 1
RS 485 card
NET 1
NET 2
MAX 6 CARDS
Digi Crown pci / isa

2. ISA CARD



The *DigiCrown* ***isa*** unit achieves the RS485 Half Duplex serial communication with the rest of the network. Each card is equipped with two serial ports, for the overall management of 31 + 31 sensors or I/O modules.

Up to 4 cards can be interlinked (see paragraph 4.1), for the management of up to 8 networks (248 active units).

The LEDs next to the serial ports display the operating status of the card (Chapter 7).

2.1. Before starting installation…

In order to ensure the correct operation of the ***isa*** card, a PC with the following minimum specifications is needed:

- One free ISA slot
- Microsoft Windows operating system (Windows 95, 98, 2000, NT, XP)

Installing the ISA card on a standard PC.

Use the installation procedure described in the following chapter (CARD Setup). Windows provides a vast number of addresses for the system, we suggest using those indicated below, which should usually be included among the available resources.

CARDS	COM#	ADDRESS	IRQ
CARD 1	COM ***a***	0100	10
	COM ***b***	0108	11
CARD 2	COM ***c***	0110	5
	COM ***d***	0118	7

The most critical resource may be the interrupt value, especially in the case of two cards. Therefore, in this case, interrupts 5 and 7 may be at risk. If so, it is best to disable the device that is not in use (for example the BIOS parallel port), and designate the required available interrupts as LEGACY ISA.

Installing the ISA card in a Marposs E9066N industrial PC

MARPOSS SpA supplies the ISA cards with a series of default address and interrupt settings, as indicated in the below table:

CARDS	COM#	ADDRESS	IRQ
CARD 1	COM ***a***	**(*)** 0100	**(*)** 10
	COM ***b***	**(*)** 0108	**(*)** 11

To simply installation on Marposs Industrial PCs, the company supplies all E9066N systems with the following default BIOS settings:

interrupt 10 LEGACY ISA

interrupt 11 LEGACY ISA

As the addresses **0100** and **0108** are normally free, these pre-settings help to simplify the installation procedure (there is no need to move any jumpers on the card) and all the user has to do is select the suggested values **(*)** when carrying out the COM installation procedure on the E9066N (see chapter 3 CARD Setup)

3. CARD SETUP

3.1. Setup of PC for housing the *isa* card

Click on *"Start"* → *"Settings"* → *"Control panel"* and double-click on *Add/Remove Hardware"* (see Fig. 3).

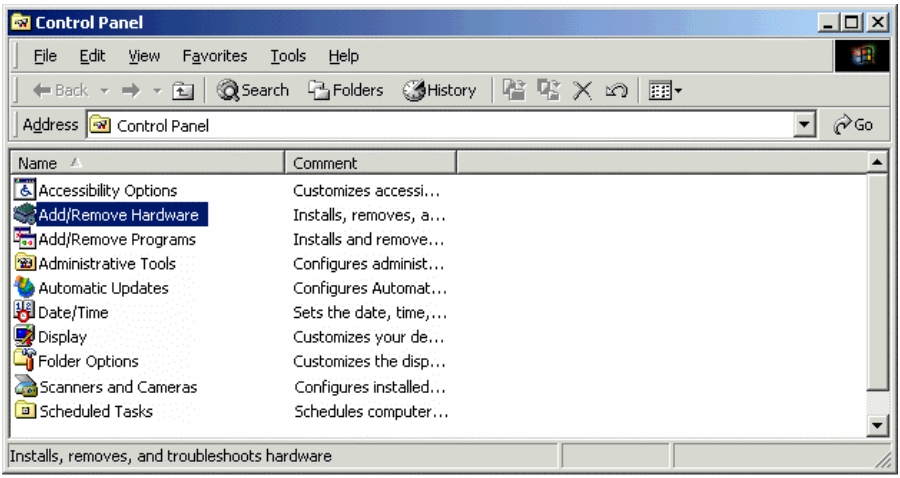


Fig. 3

As soon as the window shown below appears (Fig. 4), press the "*Next*" pushbutton.

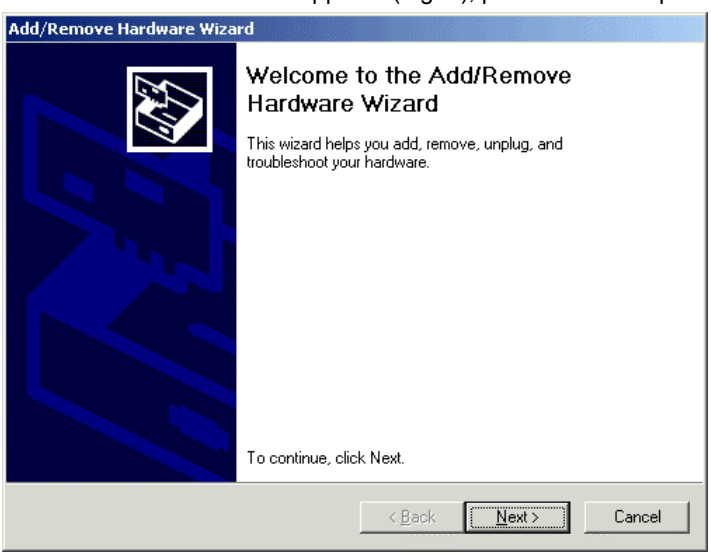

Add/Remove Hardware Wizard
Welcome to the Add/Remove Hardware Wizard
This wizard helps you add, remove, unplug, and troubleshoot your hardware.
To continue, click Next.
< Back
Next >
Cancel

Fig. 4

Select the *"Add a device"* option and press *"Next"* (Fig. 5).

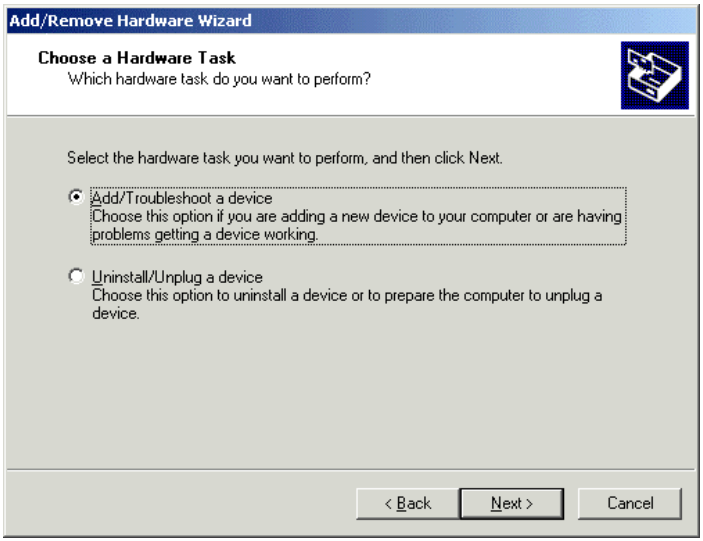

Add/Remove Hardware Wizard
Choose a Hardware Task
Which hardware task do you want to perform?
Select the hardware task you want to perform, and then click Next.
Add/Troubleshoot a device
Choose this option if you are adding a new device to your computer or are having problems getting a device working.
Uninstall/Unplug a device
Choose this option to uninstall a device or to prepare the computer to unplug a device.
< Back
Next >
Cancel

Fig. 5

In the following window (Fig. 6), select "*Add a new device"* in the list of devices, and press *"Next"*.

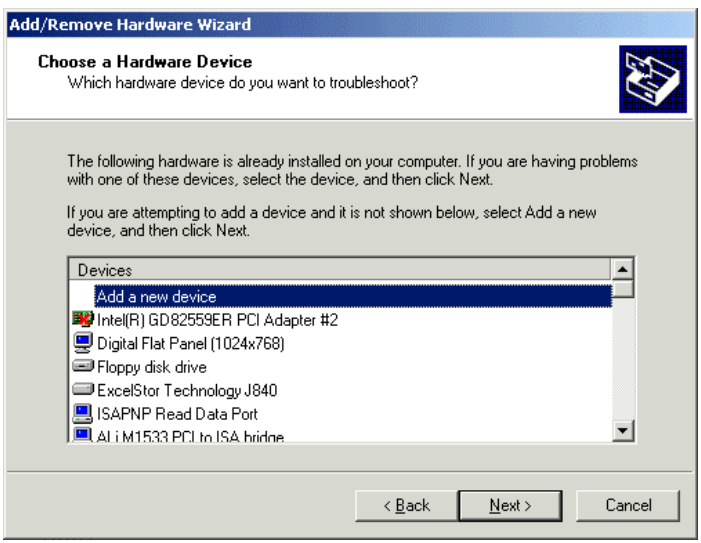

Add/Remove Hardware Wizard
Choose a Hardware Device
Which hardware device do you want to troubleshoot?
The following hardware is already installed on your computer. If you are having problems with one of these devices, select the device, and then click Next.
If you are attempting to add a device and it is not shown below, select Add a new device, and then click Next.
Devices
Add a new device
Intel(R) GD82559ER PCI Adapter #2
Digital Flat Panel (1024x768)
Floppy disk drive
ExcelStor Technology J840
ISAPNP Read Data Port
< Back
Next >
Cancel

Fig. 6

In the guided-procedure window (Fig. 7), select the second option, *"No, I want to select the hardware from a list"* , then press *"Next"*.

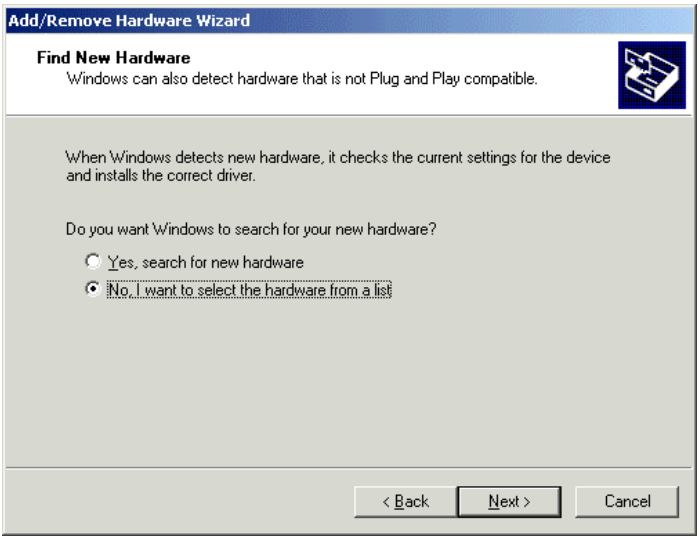

Add/Remove Hardware Wizard
Find New Hardware
Windows can also detect hardware that is not Plug and Play compatible.
When Windows detects new hardware, it checks the current settings for the device and installs the correct driver.
Do you want Windows to search for your new hardware?
Yes, search for new hardware
No, I want to select the hardware from a list
< Back
Next >
Cancel

Fig. 7

Select "*(Standard port types)*" in the list of manufacturers (Fig. 8), and click on "*Communications port*" in the list of models. Press "*Next"* to pass to the following window.

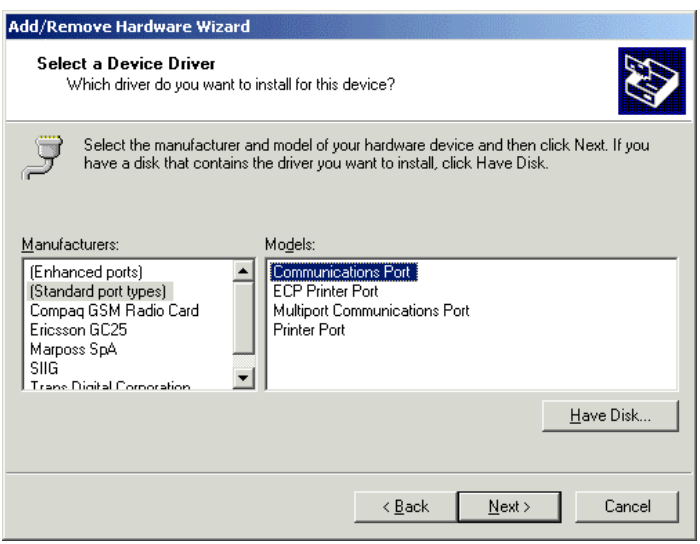

Add/Remove Hardware Wizard
Select a Device Driver
Which driver do you want to install for this device?
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
Manufacturers:
(Enhanced ports)
(Standard port types)
Compaq GSM Radio Card
Ericsson GC25
Marposs SpA
SIIG
Models:
Communications Port
ECP Printer Port
Multiport Communications Port
Printer Port
Have Disk...
< Back
Next >
Cancel

Fig. 8

In the window shown below (Fig. 9), select the option *"Ports (COM & LPT)"* , then press *"Next"*.

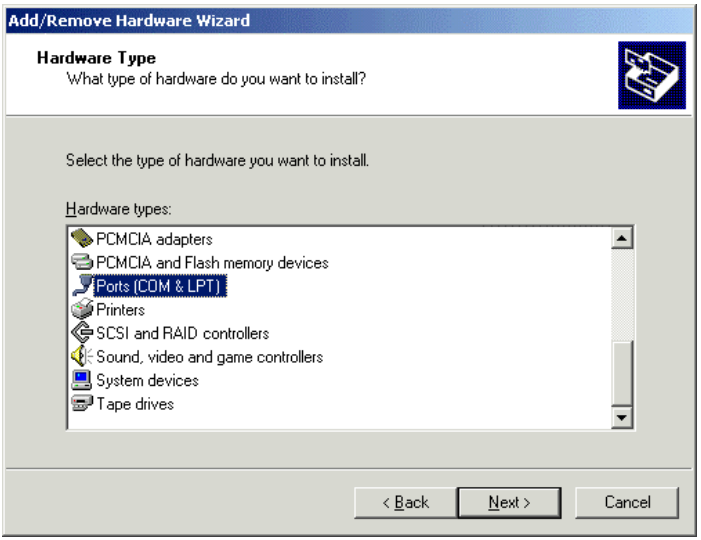


Fig. 9

Should the warning message shown below appear, click on *"OK"*.

Add/Remove Hardware Wizard
Windows could not detect the settings of the device. To use this device, you must enter its hardware settings.
Consult the documentation that came with this device for information
OK

Set a basic configuration value that does not produce any conflict in the system (Fig. 10), making sure that the "*No conflicts"* message appears in the "*Conflicting device list"* box (e.g. "*Basic configuration 0005"*). Then double-click on *"IRQ/Interrupt Request"*.

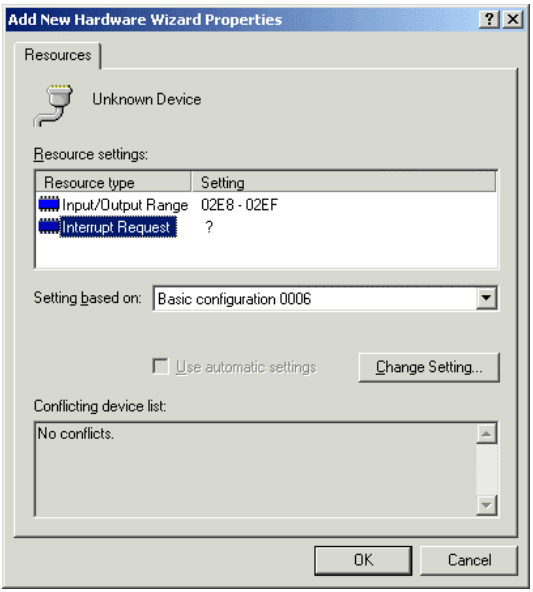


Fig. 10

Enter the interrupt-level value that you wish to set for the ***isa*** card (e.g. *Value 03*), making sure that there is no conflict (Fig. 11). Press "*OK"* to confirm.

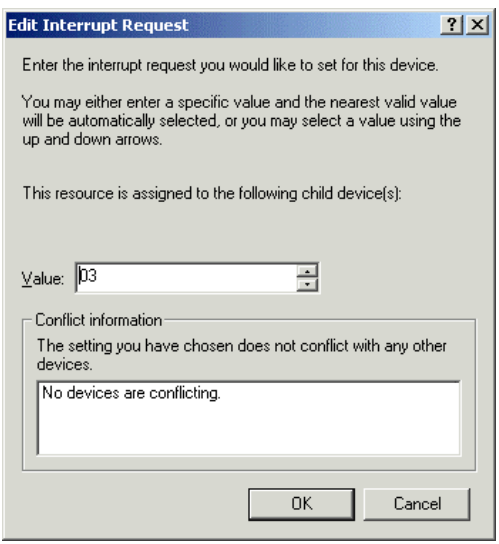

Edit Interrupt Request
Enter the interrupt request you would like to set for this device.
You may either enter a specific value and the nearest valid value will be automatically selected, or you may select a value using the up and down arrows.
This resource is assigned to the following child device(s):
Value:
03
Conflict information
The setting you have chosen does not conflict with any other devices.
No devices are conflicting.
OK
Cancel

Fig. 11

Write down the I/O interval value (e.g. *02E8-02EF*) and the interrupt/IRQ value (e.g. *03*). Press "*OK*" to confirm (Fig. 12).

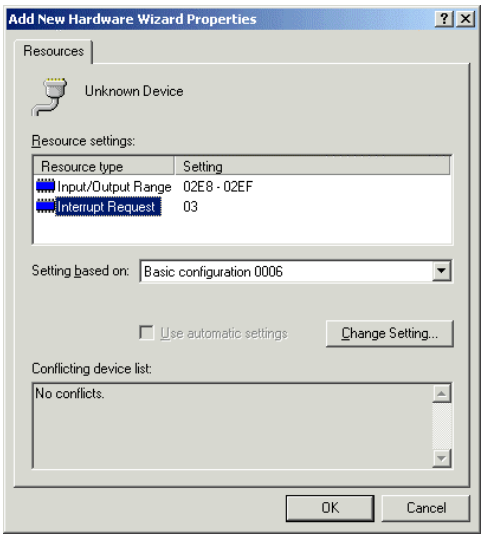


Fig. 12

Press *"Finish"* in order to complete the setup (Fig. 13) and switch the PC off.

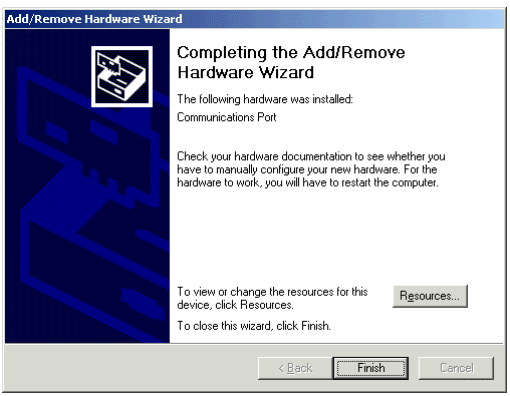

Add/Remove Hardware Wizard
Completing the Add/Remove Hardware Wizard
The following hardware was installed:
Communications Port
Check your hardware documentation to see whether you have to manually configure your new hardware. For the hardware to work, you will have to restart the computer.
To view or change the resources for this device, click Resources.
Resources...
To close this wizard, click Finish.
< Back
Finish
Cancel

Fig. 13

> ☞ ***The operations described in para. 3.1 refer to the setup procedure for a single COM port. Repeat the same procedure for each additional COM port.***

3.2. Programming the *isa* card "dip-switches"

Once the card addressing procedure has been completed, it is necessary to define the following values by programming the dip-switches:

1. The I/O interval start value (***e.g.: 0100***).
   IMPORTANT: position **ON = Ø** (see example in fig. 14).
   In this case, the following dip-switches are used:
   T102 and T103 → COM a → which communicates via connector J1
   T102 and T106 → COM b → which communicates via connector J2
2. The interrupt value.
   IMPORTANT: to select the interrupt, set only the corresponding dip-switches to ON. All the other dip-switches must be set to OFF (see example in fig. 14).
   In this case, the following dip-switches are used:
   T101 → INTERRUPT CHA → COM a (which communicates via connector J1)
   T104 → INTERRUPT CHB → COM b (which communicates via connector J2)

When setting the dip-switches it is important to bear in mind that each hexadecimal digit must be converted into 4 binary digits for use in the programming procedure illustrated in the diagram (fig. 14).

Programming dip-switches T102 / T103

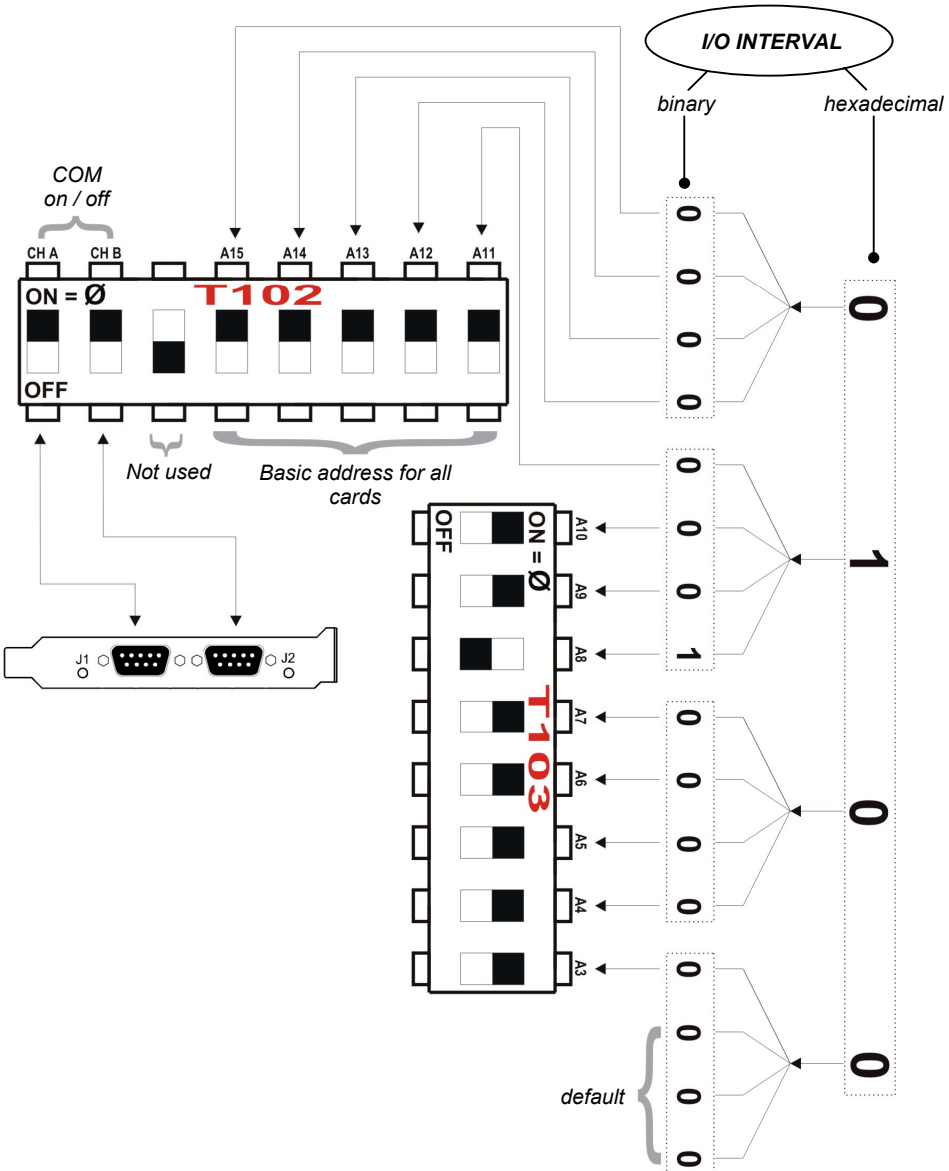


Fig. 14

Programming dip-switches T102 / T106

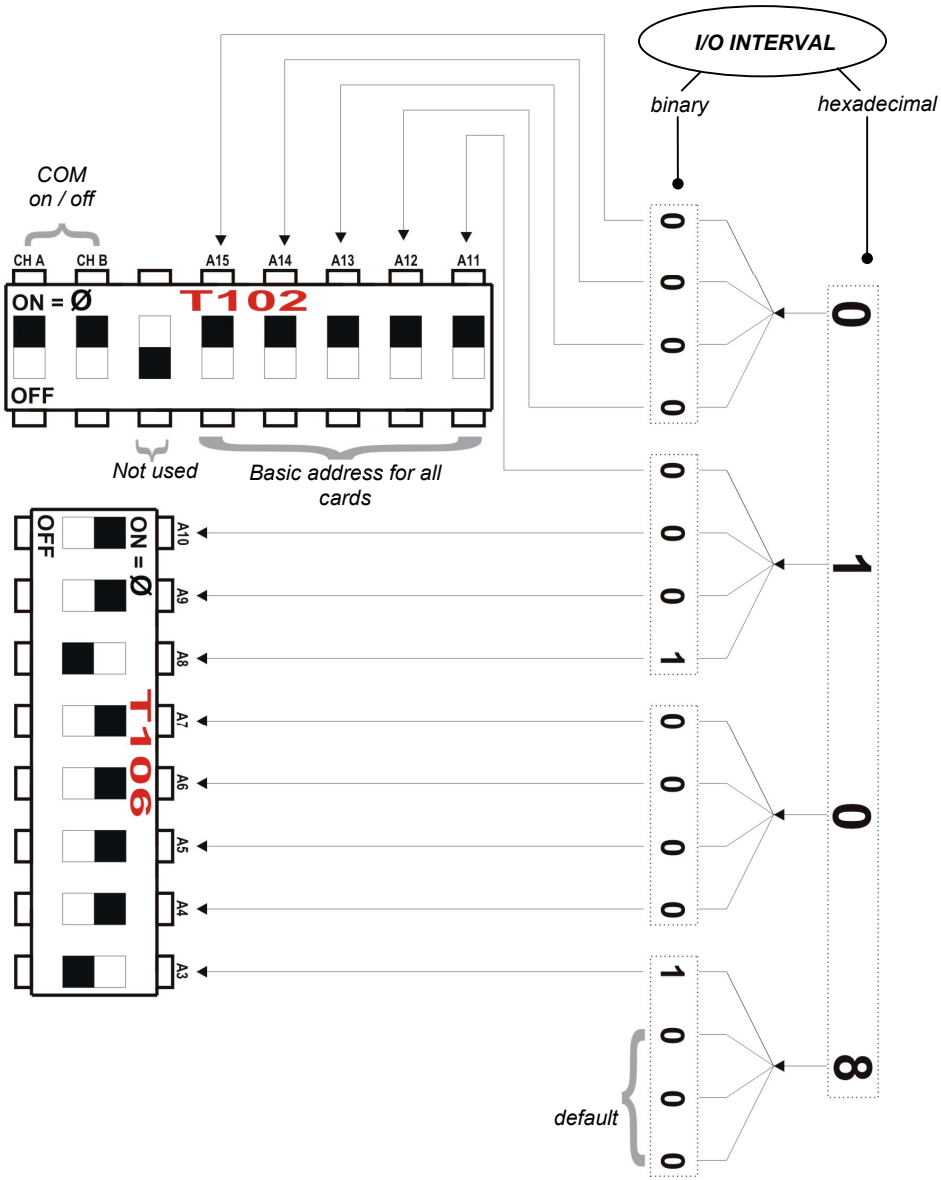
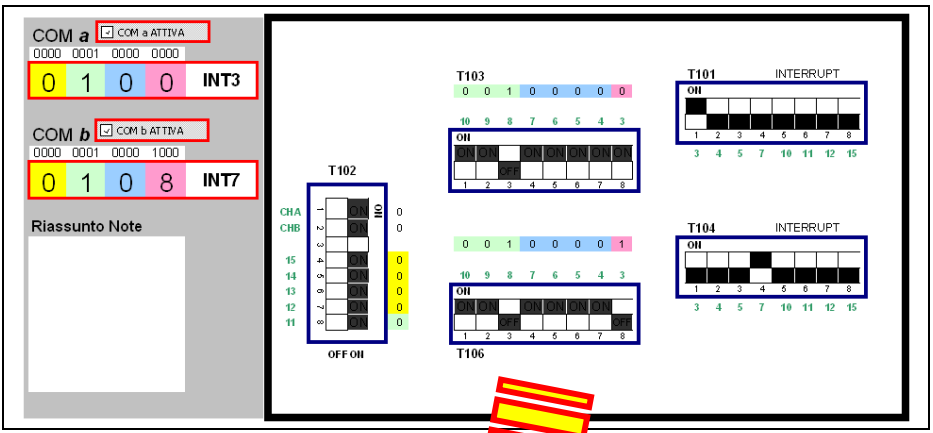
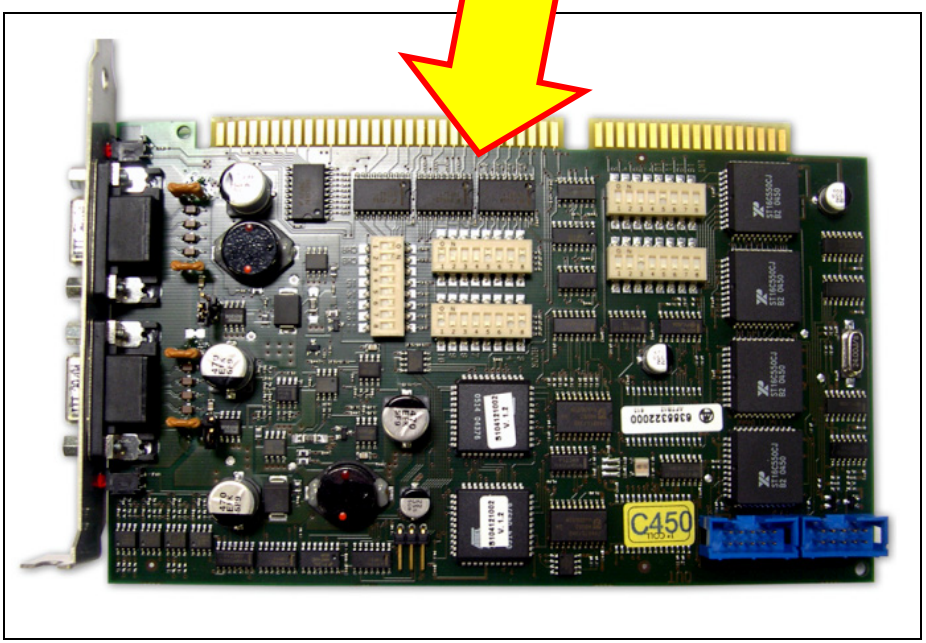


Fig. 14

In order to simplify this operation, and reduce the risk of errors to a minimum, a "CONFIGURATOR" is provided in Excel format that allows the user to define the position of the dip-switches ***graphically,*** based on the hexadecimal values defined using the Windows installation procedure.



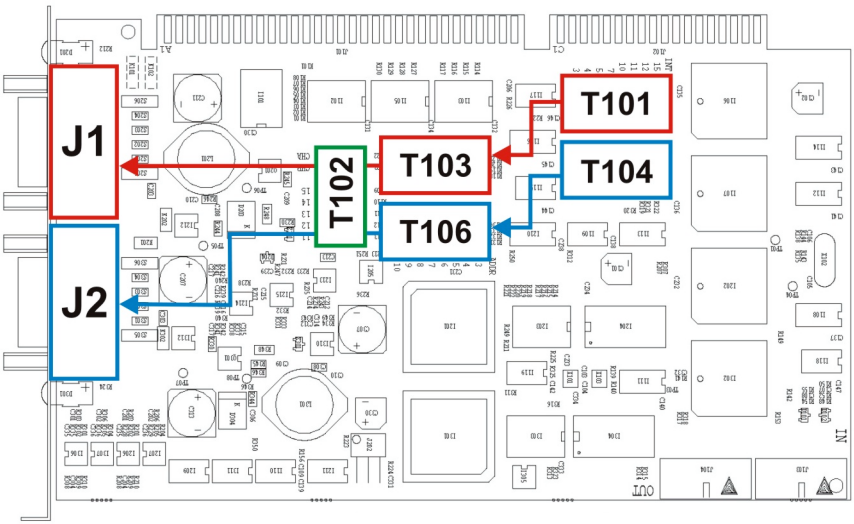
How to interpret the graphic configurator with reference to the card…



Relationship between Dip Switchs → COM → Board connectors

COM a → INTERRUPT T101 → T103 and T102 → **J1**

COM b → INTERRUPT T104 → T106 and T102 → **J2**



Summary of *isa* card dip-switch functions

- T102 → used for:
  - settings that are common to the two COM ports
  – basic addresses for all cards
  - enabling/disabling the COM a/b ports (serial connectors J1/J2)
  Dip-switch position ON (in the case of addresses: bit=0)

- T103 → sets the specific I/O addressing start value for the COM ***a*** identified as J1.
  Dip-switch position ON (in the case of addresses: bit=0)

- T106 → sets the specific I/O addressing start value for the COM ***a*** identified as J2.
  Dip-switch position ON (in the case of addresses: bit=0)

- T101 → sets the specific interrupt/IRQ value for the COM identified as J1.
  To enable the INTERRUPT value set the corresponding dip-switch to **ON** and all the others to OFF.

- T104 → sets the specific interrupt/IRQ value for the COM identified as J2.

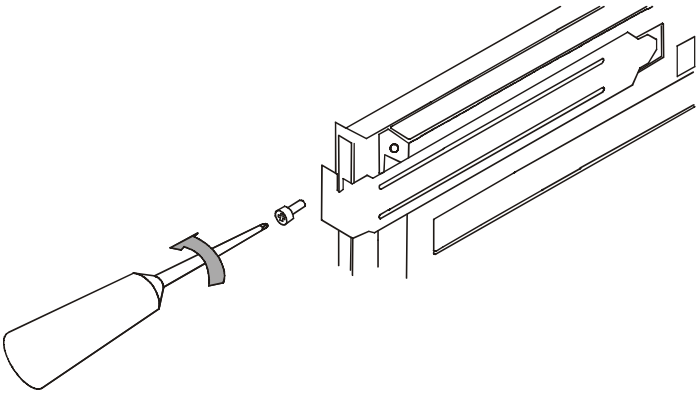
To enable the INTERRUPT value set the corresponding dip-switch to **ON** and all the others to OFF.

N.B.: • **T101 + T104 must not have the same interrupt enabled.**

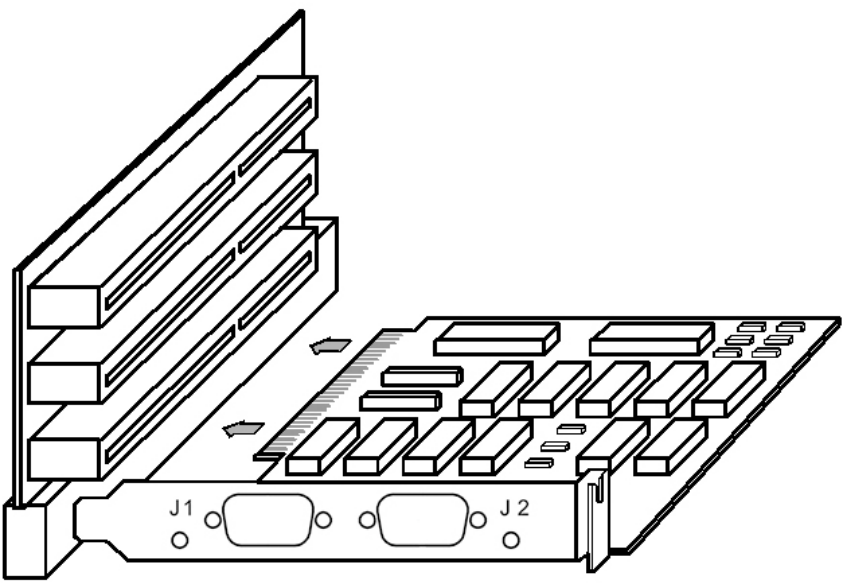
• **If a COM (a or b) is disabled (by setting the corresponding position on T102), set all the corresponding INTERRUPT dip-switches to OFF in order to free this resource on the BUS and make it available to other devices.**
Example:
COM a disabled
T102 → dip switch CHA set to OFF
T101→ all dip-switches set to OFF
or
COM b disabled
T102 → dip switch CHB set to OFF
T104→ all dip-switches set to OFF

4. INSTALLATION OF *ISA* CARD IN THE PC

When you have completed the procedure for the configuration of the dip-switches of the ***isa*** card, install the device in the PC. Switch the computer off, and remove the frame and the metal cover that protects the slot.



Insert the card in a free ISA slot.



4.1. Synchronization of cards

The cards are interlinked by means of the OUT-IN connectors (Fig. 14), using the 10-pins flat cable that is supplied (Fig. 15). This connection extends the synchronization of the measurement reference frequencies between the various networks to up to 4 ***isa*** cards (=8 networks). An “isofrequency” system is thus obtained.

The flat cable must be connected to the OUT connector of a card, which becomes the master one, and to the IN connector of the next card. If further cards are present, the OUT connector is connected to the IN connector of the third one, and so on.

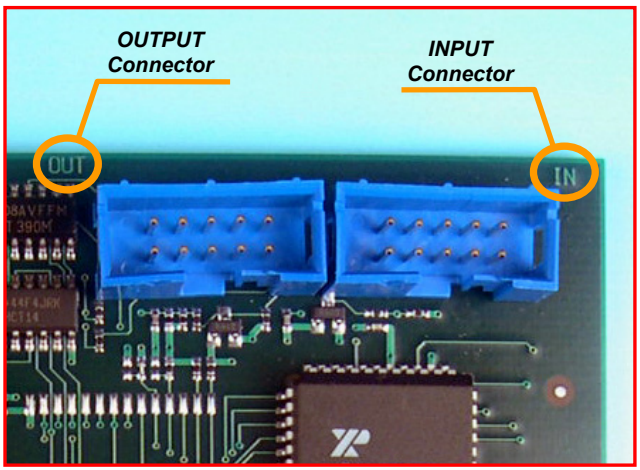


Fig. 14

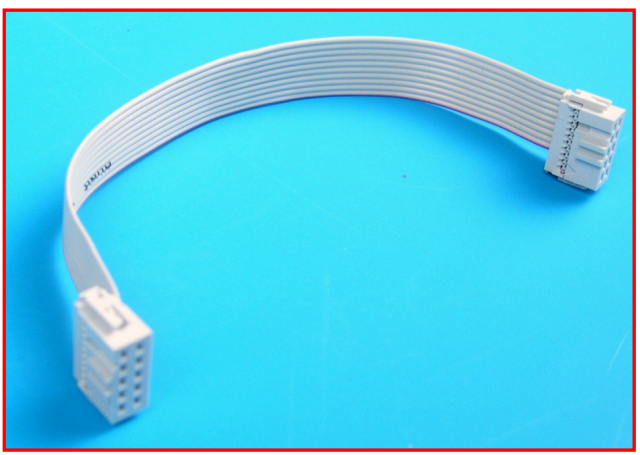
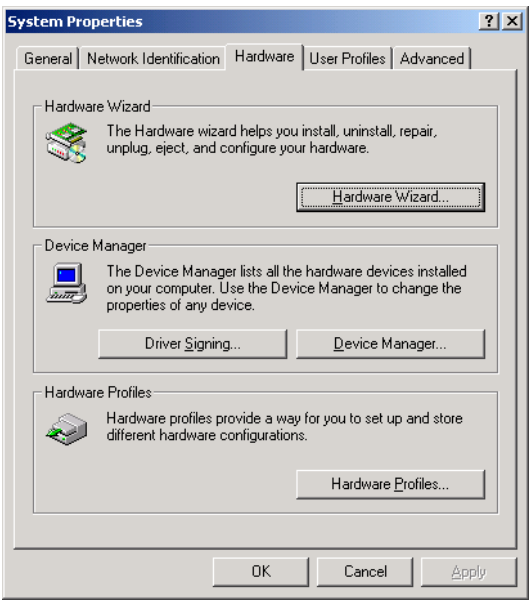


Fig. 15

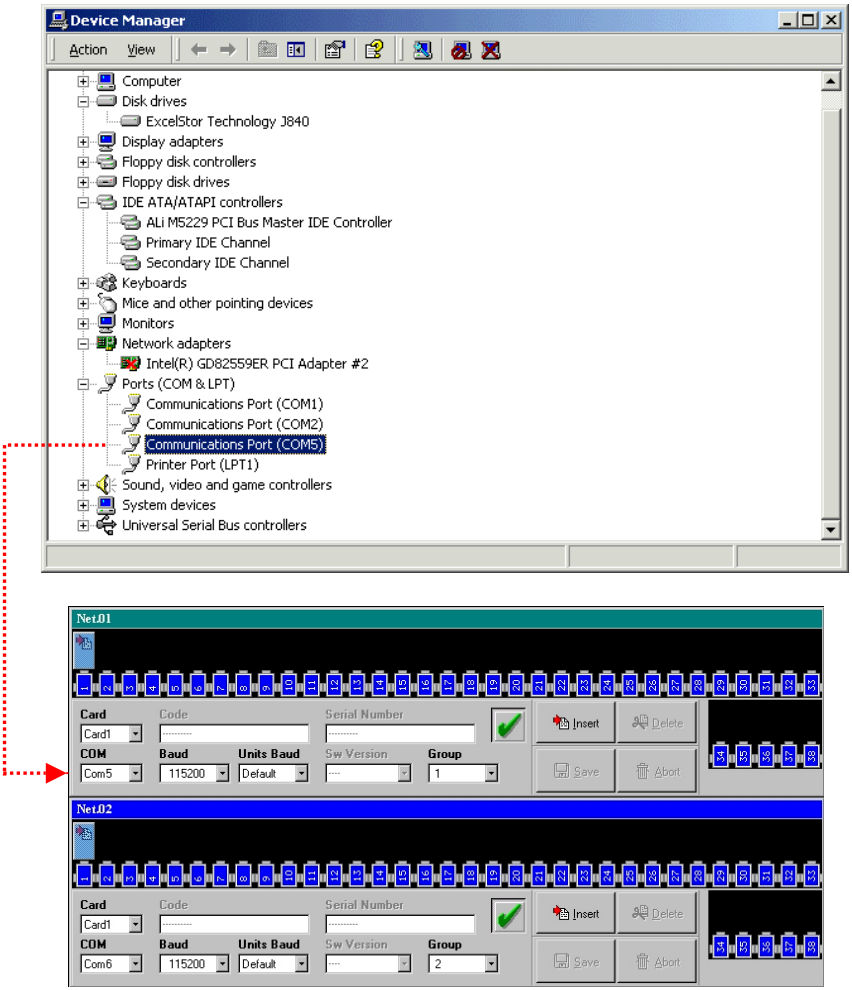
5. CHECKING THE INSTALLATION OF THE *ISA* CARD

After the installation of the card has been completed, close the cover and restart the PC.

To check whether the card has been correctly installed, click the right-hand key of the mouse on *"My computer"*, in the Windows desktop. Click *"System properties"* and select *"Hardware"*: the window shown below appears.


System Properties
General
Network Identification
Hardware
User Profiles
Advanced
Hardware Wizard
The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.
Hardware Wizard...
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Driver Signing...
Device Manager...
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles...
OK
Cancel
Apply

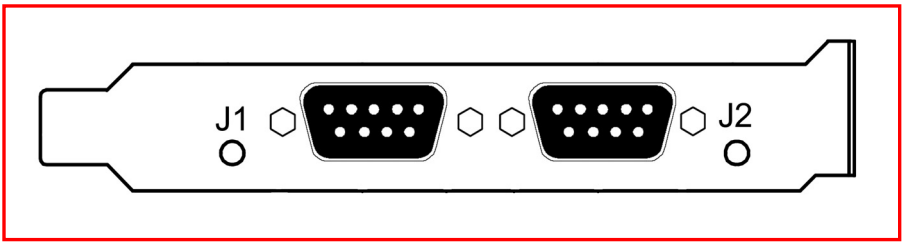
When you click on the *"Device manager"* (or *"System"*) key, the window shown below appears. Expanding the *"Ports (COM & LPT)"* item, the new COM port installed with the ***isa*** card is included: Windows calls it *"Communications Port"*.



The numbering attributed by Windows to the COMs shown in the *"Device manager"* window (COM5, COM6, etc.) is the same that must be entered in the "MDHQSPC" configuration software.

> ***Install a standard driver for serial ports in case the isa card is not recognized by the system as described in Chapter 5.***

6. CONNECTION OF NETWORKS TO CARDS



The connection of the networks is made by means of an RS-485 serial cable, directly to connectors “J1” and “J2”.

The cables come in the following lengths:

- 2 m code **6738057016**
- 10 m code **6738057023**
- 15 m code **6738057022**
- 25 m code **6738057017**

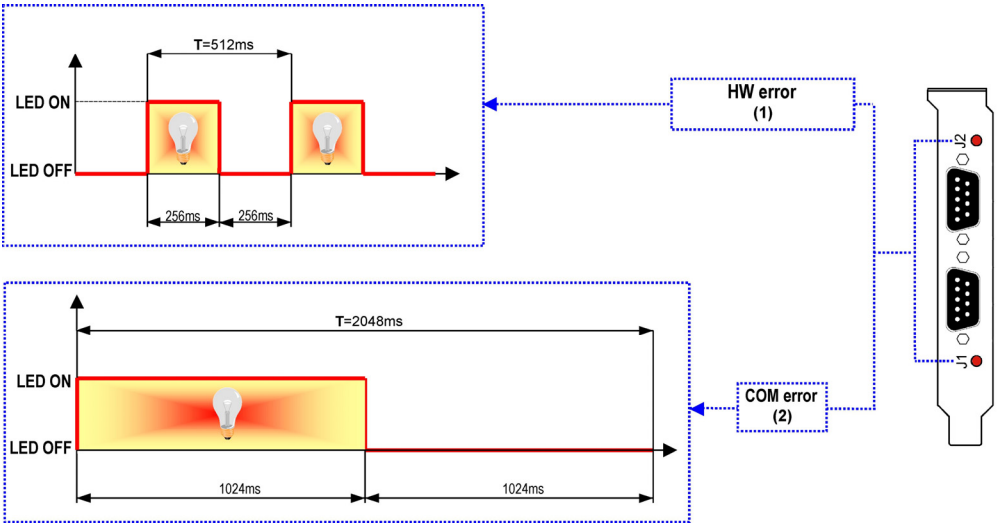
7. LED FOR DISPLAY OF UNIT OPERATING STATUS

The type of lighting of the red LED on the ***isa*** module indicates the operating status of the unit. There are the following flashing modes:

- "ON ERROR" *(the LED is activated only when an error is generated)*

- "AUTOMATIC" *(this mode includes both the ON ERROR warning and brief flashes to indicate the network sessions pending).*

7.1. “ON ERROR” / “AUTOMATIC” mode

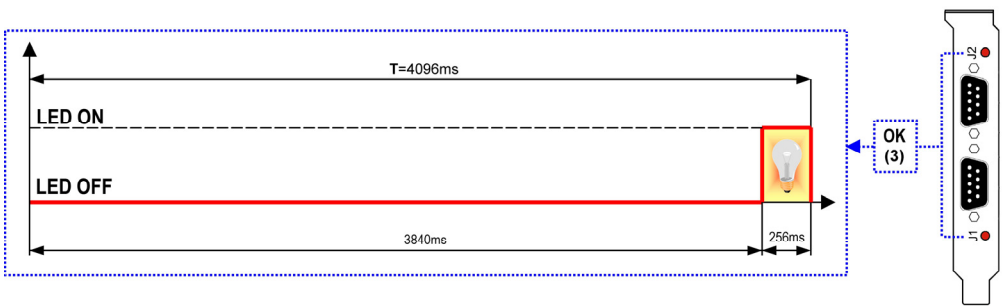


Notes:

(1) HW ERROR → general hardware and bootstrap errors

(2) COM ERROR → general serial driver and/or protocol error

7.2. “AUTOMATIC” mode



Note:

(3) OK → the network is in working order

8. CALCULATION OF ABSORPTION

To calculate the total absorption of the card and networks from the +5 V of the ISA slot, consider:

$V_{network}$ = 7.5 Vdc

P_{card} = 1.5 W

K = 1.25 *(efficiency of **DC/DC** converter)*

$I_{network} = I_{modules} \times N_{modules}$

$P_{network} = V_{network} \times I_{network}$

$P_{total\ absorbed} = P_{network} \times K + P_{card}$

E.g.: the example shown below is specific for a DigiCrown configuration with a maximum RS-485 cable length of 10 m.

$N_{modules}$ = 31 + 31 = 62

$I_{modules}$ = 0.04 A

$I_{network}$ = 62 x 0.04 = 2.48 A

$P_{network}$ = 7.5 x 2.48 = 18.6 W

$P_{total\ absorbed}$ = 18.6 x 1. 25 + 1.5 = 24.75 W

9. GROUND CONNECTION

In this chapter are reported different technical solutions in order to make sure the *DigiCrown* system is properly grounded, according to the NET's configuration and to the lay-out of the different units.

The purpose of ground connection is to minimize as much as possible the electrical noise and the interference, typically affecting the measurement signal.

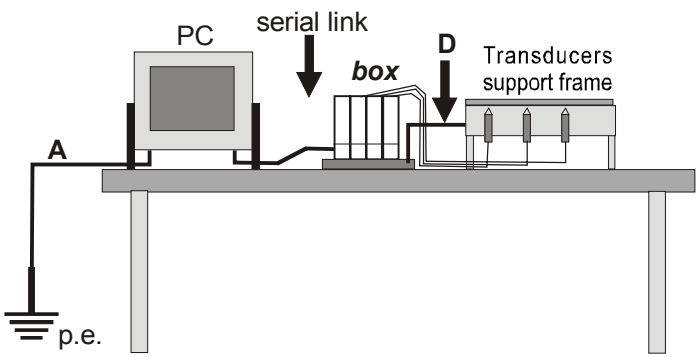
The ground connections schemes reported in this paragraph represent the optimal solution in order to have a system fully compatible with the EMC standards, according to the following directives:

- 73/23/EEC
- 2004/108/CE
- EN55022: 1998 (EMC)
- EN55024: 1998 (EMC)

If for a specific application the customer considers such technical solutions not required, Marposs is not responsible for any possible inaccurate working condition of the devices.

- **Bench application n. 1**

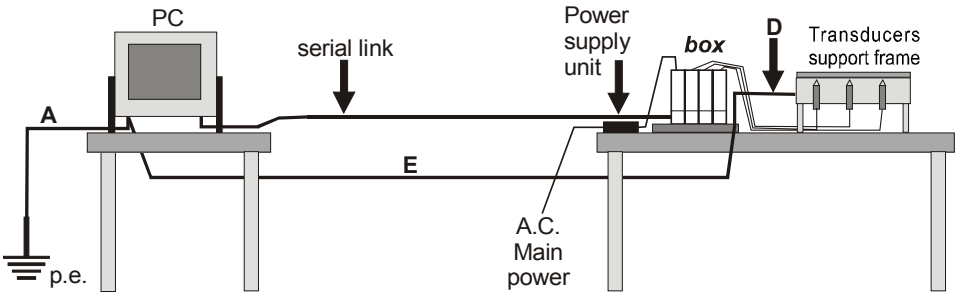
  The whole *DigiCrown* system (control + measurement) has been placed on a single bench gauge.



The "**D**" equipotential connection between the ***box*** modules and the transducers support frame, can be done whether a metallic conductive frame is used. In the glass gauging applications the transducers support frame is usually not a conductive material and the transducers are typically insulated, in this case no ground connection is required.

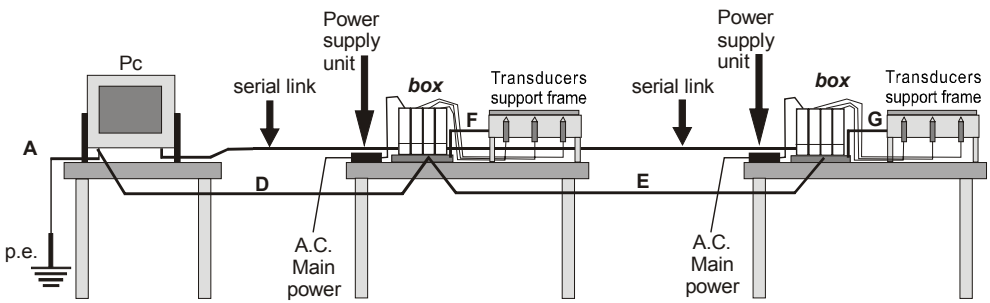
- **Bench application n. 2**

  In case the control system (PC…) is placed on a bench while the transducers and the ***box*** modules on another, we suggest to set-up an equipotential link as shown in the points: **A + D + E**.



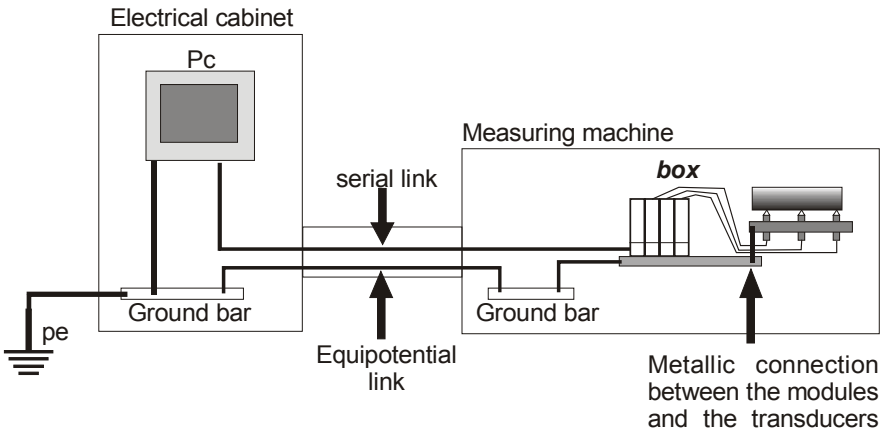
- **Bench application n. 3**

  If the *DigiCrown* system is split on two or more benches, we suggest to set-up an equipotential link as shown in the points: **A + D + E + F + G**.



- **<u>Automatic machine application</u>**

  For such applications it is strongly suggested to provide the ***box*** units and the transducers support frame with an equipotential link: in the automatic machine applications the eddy-currents normally flow in the transducer's shield.



10. TECHNICAL SPECIFICATIONS

DigiCrown ***isa*** (code **6355322000)**

Power supply ……...from ISA bus standard 5 V

Absorption (P) (*).....……..…1.5 W + power towards networks

Absorption from +5 (I).....……0.2 A + current towards networks

INPUT/OUTPUT……..*DigiCrown* HW&protocol compatible

RS485 rate.....……..……prog. Baud 9600 or 208333

Operating temperature...……..standard PC

Maximum network length……up to 1 Km (depending on network configuration)

Number of networks per card……..2

Dimensions……..……standard compact ISA

Absorbed power ...……..……..……see Chapter 8

(*) → Power required for management of configuration. Should the power supply unit integrated in the PC not be able to supply this power, a *DigiCrown* ***psu+psc*** module must be installed.

11. DECLARATION OF CONFORMITY

MARPOSS S.p.A. hereby declares that the devices described in this manual comply to the EMC electromagnetic compatibility requirements, in compliance with the following directives:

73/23/EEC	of 02-19-1973	(LOW VOLTAGE directive)
2004/108/CE	of 01-20-2005	(EMC directive)

The devices have been designed, assembled and tested in compliance with the following European standards:

EN55022 : 1998	(EMC)
EN55024 : 1998	(EMC)

12. ORDERING CODES

The tables below are a general summary of the ordering codes for all the components of the *DigiCrown Probing Line*.

The highlighted parts are the elements described in this manual.

INTERFACES

ORDER CODE	DESCRIPTION
767X000000	DIGI CROWN BOX
767X000200	DIGI CROWN BOX + RAM
767Y000000	DIGI CROWN 232
767Y010000	DIGI CROWN USB
767W000000	DIGI CROWN PSU (110-240Vac / 7,5Vdc)
767W010000	DIGI CROWN PSU (24Vdc / 7,5Vdc)
767I000000	DIGI CROWN I/O SINK
767I010000	DIGI CROWN I/O SOURCE
767I020000	DIGI CROWN I/O ONLY INPUT
6355321000	DIGI CROWN PCI
6355322000	DIGI CROWN ISA

ACCESSORIES

ORDER CODE	DESCRIPTION
6355200000	END LINE CONNECTOR
6872030010	DIGI CROWN BUS
6872030011	DIGI CROWN PSC
4147000013	EU PLUG
4147000014	USA PLUG
4147000015	UK PLUG
4147000016	EU CABLE
4147000017	USA CABLE

EXTENSIONS

ORDER CODE	DESCRIPTION
6738057016	CONNECTION CABLE 2m
6738057023	CONNECTION CABLE 10m
6738057022	CONNECTION CABLE 15m
6738057017	CONNECTION CABLE 25m

SW packages

ORDER CODE	DESCRIPTION
CM2Z22MA00	QSPC
CM2F22MA02	EASY ACQUISITION
CM2A12MA01	MARPOSS DRIVER LIBRARY

Notes

Notes

2002/95/CE
2002/96/CE

The product and any part that can be mechanically separated from it must not be disposed of the environment and must not be disposed of as municipal or general waste (Law for national adoption of European directives 2002/95/EC and 2002/96/EC and others). The provisions of the law only apply to products identified as WEEE (waste electrical and electronic equipment) marked with the appropriate symbol and in any case put on the market after 13 August 2005. Once put out of use, the WEEE product may contain substances and parts that are harmful to human health and the environment and which must be subject to professional treatment for reuse, recycling or definitive disposal. Deliver the WEEE product to an authorised WEEE treatment centre, or contact the local organisation responsible or your nearest Marposs service centre for information. Illegal disposal of a WEEE product is a crime punishable by penalties.

A complete and updated list of the addresses is available in the Marposs website: www.marposs.com - www.testar.com

D4340034GF - *Edition 09/2007 – Specifications subject to changes.*
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